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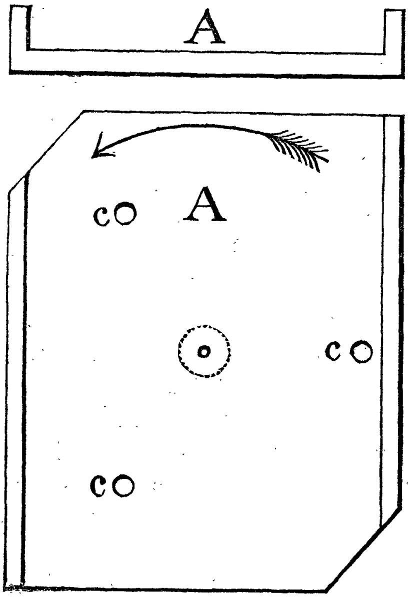
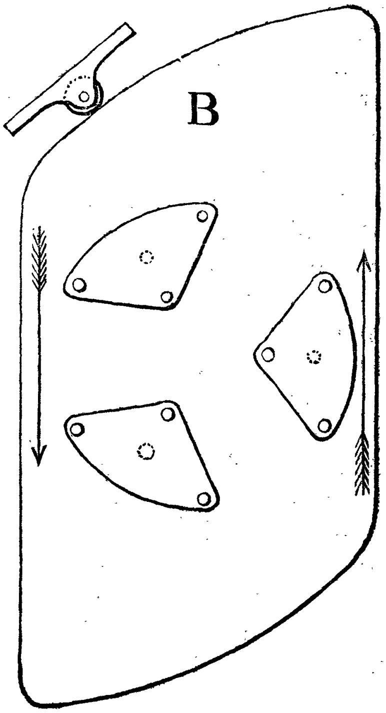
Description of an Improvement in his Machine for Polishing Specula. By Mr. Lassell.

"During a pretty extensive use of the polishing machine described in the eighteenth volume of our *Memoirs,* and while seeking especially a higher excellence of defining power than I had up to that time attained, I noticed that the first progress of incipient polish manifested an *annular* structure, and, therefore, gave unequivocal evidence of some want of uniform action over the whole surface of the speculum.

"In some instances I have noticed the lustre first appearing in a central spot of perhaps a tenth part in diameter of the diameter of the speculum, and surrounded by six or eight annuli of partially polished surface, alternating up to the edge of the speculum with annuli of less reflective surface. As the polishing process advanced, this inequality of lustre became less evident, and when completed no trace of it was apparent. But, of course, the inference was inevitable, that the same irregularity must exist, though not manifest to the eye; and I forthwith became persuaded that it would be necessary, if possible, to introduce some transverse action, in order to wipe out, as it were, these rings, which, it appeared, the purely circular motion of the quick and slow-moving cranks had a tendency to produce.

"This end has been accomplished with, I think, perfect success, by a simple apparatus introduced between the upper surfaces of the vertical spindle and the speculum itself, leaving all the motions of the upper cranks and other parts of the machine untouched.





"In the annexed figures, A A are two views of a cast-iron plate

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about half-inch thick, which, by the three holes C, drops upon three studs screwed into the upper surface of the wheel of the vertical spindle carrying the speculum. B is a plate about the same thickness as A, placed on A's surface, and easily sliding within the ribs cast on the edges. On the upper surface of B, the speculum rests on its plates. The ends of B are curved, as in the figure, and as the plates A and B revolve, carried by the vertical spindle, the curved ends of B are *each* brought, *once* in a revolution, in contact with a pulley or roller fixed in the upright wall-plate of the machine, and adjustable as to proximity. The contact of the roller forces B to slide, smoothly and regularly, athwart A, producing the effect of a regulating or correcting cross stroke, amidst all the circular ones, and quite annihilating all ring-like tendency. The amount of lateral thrust necessary is not great, and I have used from one inch with a nine-inch speculum to one and a half or two inches with a two-foot speculum. With a shorter proportion of focus, less than this would be sufficient; for its effect is to reduce in some degree the parabolic tendency of the machine.

"The improvement of definition, as well as of certainty in the operation, which this simple arrangement produces, is most striking, and gives, I would almost venture to say, the last touch of perfection to the machine.

"*Valetta, 24th November, 1852.*"

On the Figuring of Specula. By Warren De La Rue, Ph.D., F.R.S.

It has been said of the reflecting telescope, that "no one, competent to form a judgment on the subject, was ever satisfied with such an instrument, excepting the man who made it." This remark, inasmuch as it may be referred to the definition of a fixed star, is so true, that, in my own case, I include the maker of the instrument as also one of the dissatisfied parties. At the same time it must, however, be stated, that I usually succeed in producing thirteen-inch mirrors, which define the planets *Mercury*, *Venus*, *Mars*, *Jupiter*, *Saturn*, and *Uranus*, with the surface of the moon, and particularly its *bright* limb, in a manner rarely equalled, and never surpassed, by any of the refractors which I have yet had an opportunity of looking through. I am, however, free to confess, that they defined a fixed star much more satisfactorily than my best mirrors.* I am, therefore, inclined to believe that it requires a far more accurate figure in order to show a *star free from rays*, in the case of a reflector, than in that of a refractor. Difficult as the attainment of this object has hitherto proved, recent results of my own, as well as those obtained by Mr. Lassell by means of his "transverse-motion," lead me to hope that the obstacles in the way of that attainment are not insurmountable. The design of the present communication is, indeed, to bring under the notice of the Society two additions to Mr. Lassell's polishing-machine; which,

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* I have seen the components of ω *Leonis* neatly separated by the mirrors to which I allude.

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